San Diego Math Circle
www.sdmathcircle.org

History, Structure, and Curriculum

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Why We're Here

Students enjoying the Math Circle

History

San Diego Math Circle

Founded in 2003-04 by Richard Rusczyk (AoPS) with about 20 local students.

Initially: organized by AoPS and hosted at the University of California, San Diego.

Through 2006, an SDMC website was hosted as part of Art of Problem Solving.

It has since split off onto its own website: www.sdmathcircle.org

Timeline

2003-05

Run in-house by AoPS. UCSD provides space and logistic support.

Spring 2005

Too much work for too few students. Asked parents to help recruit more students and to help with administrative tasks.

2005-06

SDMC run by AoPS with lots of parents help.

Fall 2006

Many aspects taken over by parents.

December 2006

Completely taken over by parents. 200+ students!

Moral of the story

Make the parents the primary stakeholders!

Financing/Logistics

FREE to all students in grades 5-12.

$100 donation requested by default for the school year.
Parents also requested to volunteer for a task.
No students are rejected!

UCSD and AoPS provide in-kind donations. Many corporations provided matching contributions or volunteerism grants.

Organizers and instructors are paid a modest honorarium.
Out-of-town trips (e.g. ARML) are budgeted separately.

Funds managed by Art of Problem Solving Foundation
(501(c)3 tax-exempt umbrella)
www.artofproblemsolving.org

Fun!

Organization

Students split into 3 main groups:

- Fermat — Grades 5-7
- Euler — Grades 7-9
- Gauss — Grades 9-12

SDMC meets most Saturday mornings September-March. Sessions consist of two 75-minute classes (with a 15-minute break between).

Session types:

1. Single-session topics
2. Year-long “course”
3. Contests and contest prep

Single-session Topics

Most typical “math circle” session.
Self-contained class with no specific prerequisites.

Some topics from Winter/Spring 2011:
Modular Arithmetic Geometric Arithmetic Fractals
The Rationality of Irrationals Induction Some Sums
Homothety and Inversion Recurrence Relations
Generating Functions Finite Differences

Instructors are from:

- Art of Problem Solving
- UC San Diego (both faculty and grad students)
- local middle/high school teachers
- employees at local high-tech companies
- Math Circle alumni

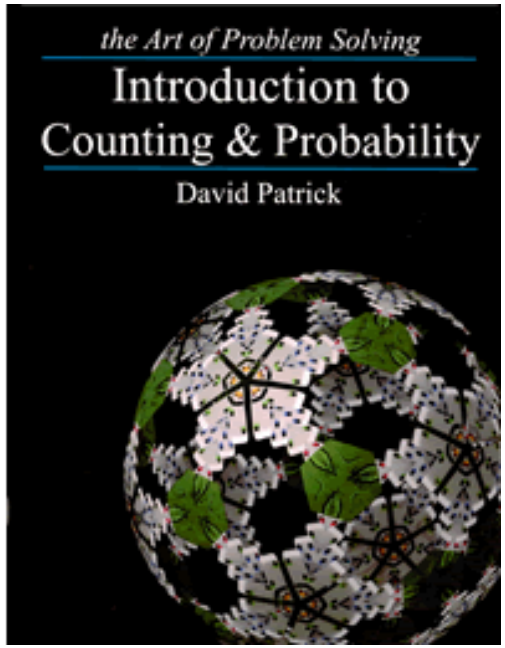
Year-long Course

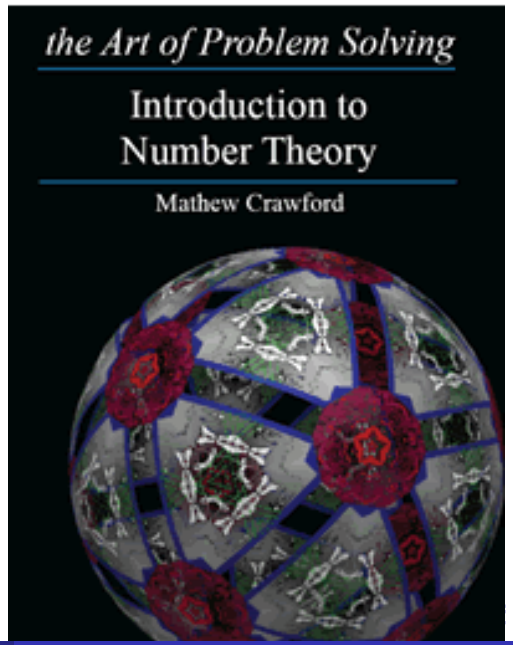
For the Euler (grade 7-9) group, one meeting per month is dedicated to a year-long course.

Topic for 2010-11: *Counting & Probability*
Alternate years' topic: *Number Theory*

Two primary instructors manage this course for the year.
Classes are sequential.

Uses AoPS textbooks.





Contests

Some classes are contest-prep, targeted at major contests.
Fermat (5-7): AMC 8 (one day only)
Euler (7-9): MATHCOUNTS (January)
Gauss (9-12): ARML Power Contest, AIME, ARML Team

SDMC is a official site for the AMC 10/12 contests.

Home-grown contests (written by AoPS staff):

San Diego Math League (twice per year)
multiple-choice & short answer

San Diego Math Olympiad (March)(invitation-only)
proof-style

ARML

Send 3 teams (15 students per team) to ARML in Las Vegas.

Resources

National Association of Math Circles
www.mathcircles.org
Lesson/Problems collection, “Circle in a Box”

Math Teachers’ Circle Network
www.mathteacherscircle.org
Lots of lesson plans (designed for teachers but easily used or modifiable for use with students)

Cut The Knot
www.cut-the-knot.org

UK Mathematics Trust
www.mathcomp.leeds.ac.uk

nrich (Mathematics Enrichment)
nrich.maths.org

Resources

Contests:
AMC (8/10/12): **amc.maa.org**
MATHCOUNTS (middle school): **www.mathcounts.org**
ARML (high school teams): **www.arml.com**

MAA Math Circles for Students and Teachers SIG
sigmaa.maa.org/mcst

Art of Problem Solving:
www.artofproblemsolving.com (main site)
Books, videos, games, resources, discussion board
www.artofproblemsolving.org (501(c)3 nonprofits)

www.sdmathcircle.org

Philosophy

- The purpose of SDMC is not only to excel at mathematics, but to develop a broad and deep understanding of how to solve problems. The thought processes developed at the SDMC will help students in any logical endeavor, be it mathematics, science, business, law, etc. Our goal is to teach students how to think creatively and effectively.
- We believe that students who can solve most of the problems they see are not being challenged enough. SDMC provides hard problems and teaches strategies for solving them. In time, avid students stretch their problem solving skills while growing in their knowledge of mathematics outside of standard school curricula.
- Strong students need a peer group of other strong students.